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Anamorphic fungi of the Atlantic Forest of southern Bahia: new records and *Dactylaria pseudomanifesta* sp. nov.[§]

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ABSTRACT — A new species, *Dactylaria pseudomanifesta*, and nine other species newly recorded from Brazil (*Beltraniella fertilis*, *Chaetosphaeria innumera*, *Dictyosporium oblongum*, *Idriella acerosa*, *Inesiosporium longispirale*, *Pseudobeltrania macrospora*, *Scolecobasidium tropicum*, *Sporidesmium coffeicola*, and *Triscelophorus curviramifer*) are presented. The specimens were recovered from the litterfall of *Parinari alvimii*, *Manilkara maxima*, and *Harleyodendron unifoliolatum*, native trees of the Atlantic Forest in Bahia State, Brazil.

KEY WORDS — conidial fungi, taxonomy, *Chrysobalanaceae*, *Sapotaceae*, *Fabaceae*

Introduction

The Atlantic Forest is the third largest biome in Brazil (after the Amazon and Cerrado) and the biome of richest biodiversity on the planet (Conservação Internacional do Brasil 2003). It is estimated that this biome contains about 20,000 plant species (of which 8,000 are endemic), accounting for 2.7% of the total number of plants of the world (Myers et al. 2000). Taxonomic studies on decomposer fungi in the Atlantic Forest are necessary, especially because

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it is a biome with a significant biologic diversity which presents a extremely high level of endemism, more strong in the south of Bahia State (Conservação Internacional do Brasil et al. 2000).

New studies on anamorphic fungi in the Atlantic Forest in Brazil have expanded the knowledge of the geographical distribution of species and diversity of fungi present in this biome (Castañeda-Ruiz et al. 2001, 2003; Caldusch et al. 2002; Gusmão et al. 2005, 2008; Cruz et al. 2007; Marques et al. 2008; Barbosa et al. 2008, 2009; Magalhães et al. 2011) but not as much in southern Bahia.

Here we present records of conidial fungi isolated from the fallen litter of the Atlantic Forest of south Bahia, including a new species, *Dactylaria pseudomanifesta*, and nine other taxa not previously reported from Brazil.

Materials & methods

The study was done in three conservation units of the biome Atlantic Forest of southern Bahia, Brazil: (1) Ecoparque, in the municipality of Una; (2) Parque Estadual Serra do Conduru (PESC), in the municipalities of Uruçuca, Itacaré and Ilhéus; and (3) Reserva Capitão, in the municipality of Itacaré.

Three specimens of three representative endemic plant species well distributed in the Atlantic Forest of southern Bahia were identified in the field: *Parinari alvimii* Prance (Oiti cumbuca; *Chrysobalanaceae*); *Manilkara maxima* T. D. Penn. (Massaranduba; *Sapotaceae*), and *Harleyodendron unifoliolatum* Cowan (*Fabaceae*). Surveys were conducted on four occasions during the period from December 2007 to July 2008. Plants were identified, georeferenced, and marked.

A 50 × 50 cm square (0.25 m²) was thrown over the litter of these trees and one leaf was randomly collected at a time, totaling ten leaves/plant under different stages of decomposition. In the Laboratory of Fungal Diversity of Centro de Pesquisa do Cacau (CEPEC) – Comissão Executiva do Plano da Lavoura Cacaueira (CEPLAC), samples were washed for one hour in running water and incubated in moist chambers (Castañeda-Ruiz et al. 2006).

After 72 hours of incubation the material was observed under the stereomicroscope and the light microscope and periodically reviewed for 30 days. All microfungi specimens were studied in a semi-permanent mounting medium (PVL resin + polyvinyl alcohol lactophenol; Trappe & Schenck 1982) and identified. Colonized leaves and semi-permanent mounts were converted into exsiccates and deposited in CEPEC herbarium.

Taxonomy

Dactylaria pseudomanifesta J.L. Bezerra & D.M.A. Magalh., sp. nov.

PLATE 1

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Differs from *Dactylaria manifesta* by its larger brown conidia.

TYPE: Brazil. Bahia: municipality of Una, Ecoparque, 15°10'01.7"S 39°03'14.2"W, on decomposing leaves of *Manilkara maxima*, 10/5/2008, D.M.A. Magalhães s.n. (CEPEC 1459).

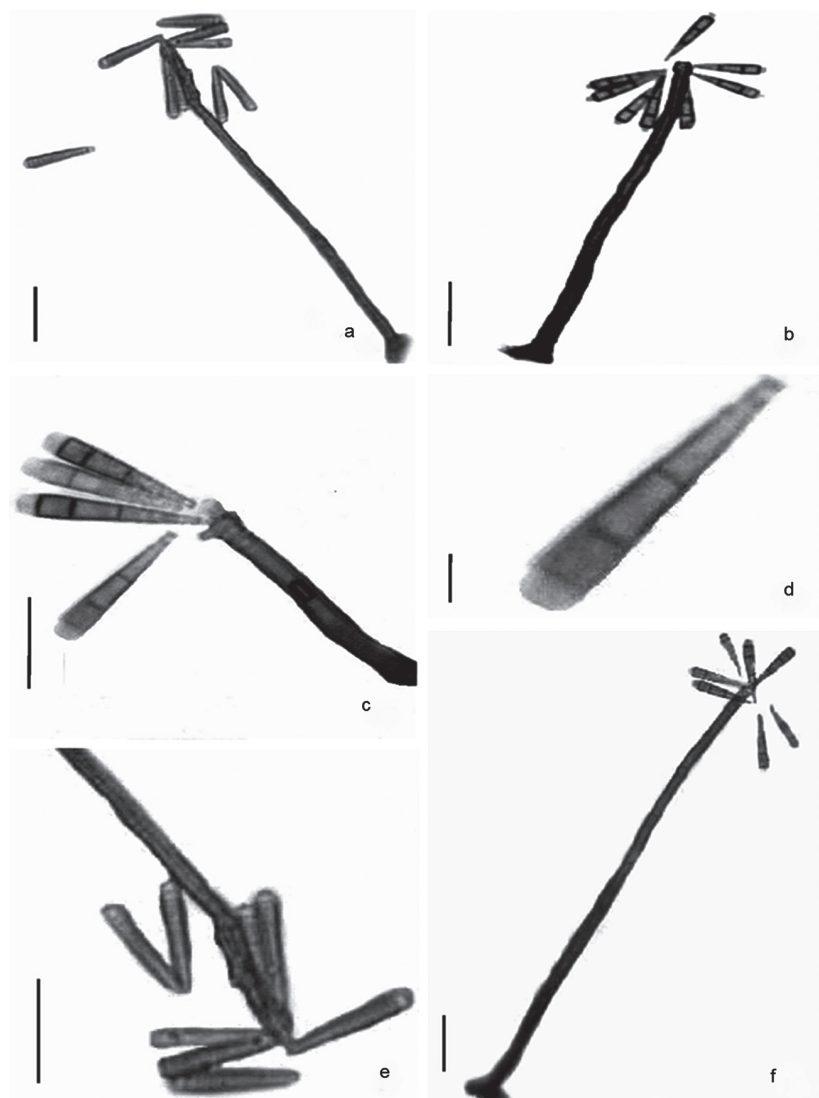


PLATE 1. *Dactylaria pseudomanifesta*: A, B, F. Conidiophores (and conidia); C–E. Conidia.
Scale bars: A, B, C, E, F = 15 µm; D = 3 µm.

ETYMOLOGY: Latin *pseudomanifesta*, referring to the similarity with *Dactylaria manifesta*.

COLONIES effuse, grayish, thin, without superficial mycelium and restricted immersed mycelium. CONIDIOPHORES simple, cylindrical, brown, septate, with

smooth walls, $55\text{--}188 \times 5\text{--}6 \mu\text{m}$. CONIDIOGENOUS CELLS terminal, integrated, denticulate $35\text{--}40 \times 5\text{--}6 \mu\text{m}$; DENTICLES apical, in number of three to five, $1\text{--}2 \mu\text{m}$ long. CONIDIA obclavate to turbinate, 3-septate, light brown with a hyaline distal cell, $17\text{--}25 \times 3.5\text{--}4 \mu\text{m}$.

ADDITIONAL SPECIMEN EXAMINED — BRAZIL. BAHIA: MUNICIPALITY OF URUÇUCA, Parque Estadual Serra do Conduru, $14^{\circ}23'07.7''\text{S}$ $39^{\circ}04'43.6''\text{W}$, on decomposing leaves of *Harleyodendron unifoliolatum*, 12/7/2008, D.M.A. Magalhães s.n. (CEPEC 1417).

COMMENTS — This species resembles *Dactylaria manifesta* R.F. Castañeda & W.B. Kendr., which differs by its smaller ($14\text{--}20 \times 3\text{--}3.5 \mu\text{m}$) and totally colourless conidia (Castañeda-Ruiz & Kendrick 1991).

Beltraniella fertilis Heredia, R.M. Arias, M. Reyes & R.F. Castañeda, Fungal

Diversity 11: 100 (2002).

PLATE 2A,B

COLONIES hypophyllous, effuse. IMMERSSED MYCELIUM with setae upright, straight, single or clustered, thick walled, smooth to slightly warty, acute, dark brown, $90\text{--}240 \times 3\text{--}6 \mu\text{m}$, bulbous base. CONIDIOPHORES macronematous, setiform, single or in small groups, straight, septate, simple or branched at the apex, $97\text{--}337 \times 40\text{--}8 \mu\text{m}$. SEPARATING CELLS unicellular, hyaline, ellipsoid, fusiform, $6\text{--}8 \times 2.5\text{--}5 \mu\text{m}$. CONIDIOGENOUS CELLS terminal polyblastic, integrated, pale brown. CONIDIA arising from conidiogenous cells or separating cells, rostrate, truncated at the base, smooth, olivaceous, with a hyaline transverse band above the equatorial zone, $15\text{--}23 \times 5\text{--}8 \mu\text{m}$.

SPECIMEN EXAMINED — BRAZIL. BAHIA: MUNICIPALITY OF UNA, Ecoparque, $15^{\circ}10'44.6''\text{S}$ $39^{\circ}02'06.4''\text{W}$, on decomposing leaves of *Parinari alvimii*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1410).

DISTRIBUTION — Described from Mexico in dead leaves of *Mangifera indica* (Heredia et al. 2002). First report for Brazil.

COMMENTS — The specimen analyzed agrees with the description presented by Heredia et al. (2002).

Chaetosphaeria innumera Berk. & Broome ex Tul. & C. Tul., Select. Fung. Carpol.

2: 252 (1863).

PLATE 2C

COLONIES effuse, black. PERITHECIA unobserved. CONIDIOPHORES single or fasciculate, septate, dark brown, smooth, up to $200 \mu\text{m}$ long, $4\text{--}6 \mu\text{m}$ wide, often percurrent. CONIDIA clustered, ellipsoid to oblong, unicellular, olivaceous, $2.5\text{--}5 \times 2\text{--}3 \mu\text{m}$.

SPECIMEN EXAMINED — BRAZIL. BAHIA: MUNICIPALITY OF URUÇUCA, Parque Estadual Serra do Conduru, $14^{\circ}23'08.4''\text{S}$ $39^{\circ}04'37.9''\text{W}$, on decomposing leaves of *Harleyodendron unifoliolatum*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1463).

DISTRIBUTION — Europe including Great Britain (Ellis 1976). First report for Brazil.

COMMENTS — The specimen analyzed agrees with the description presented by Ellis (1976). The teleomorphic phase was not observed.

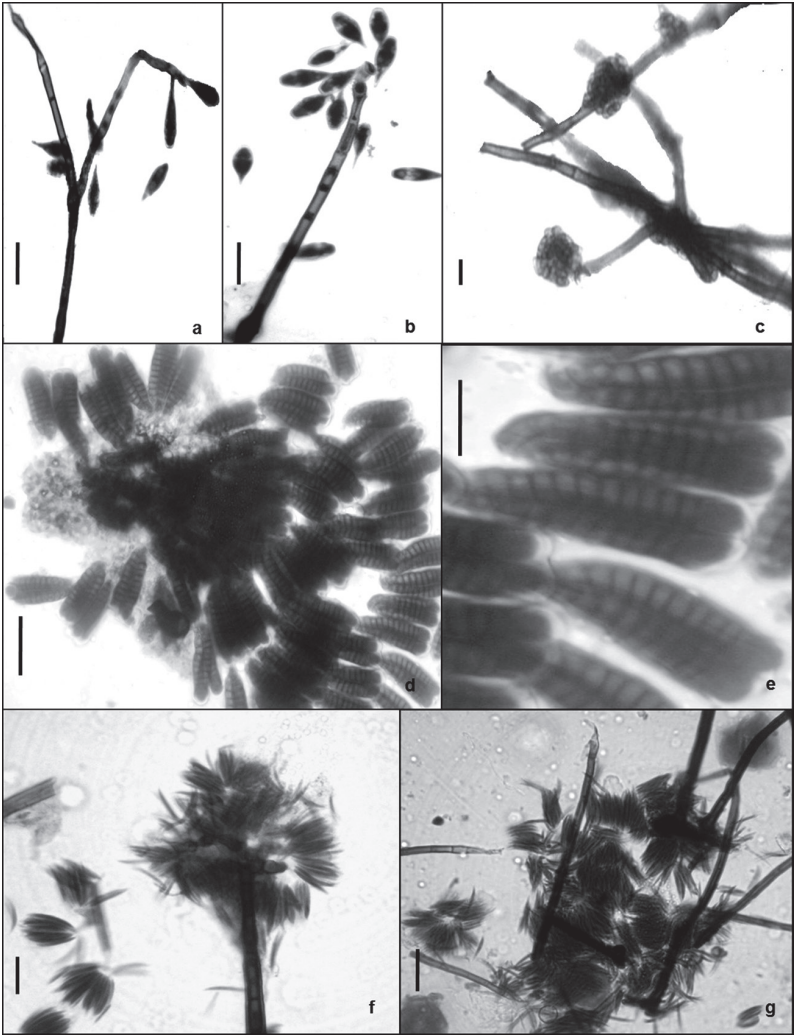


PLATE 2. Fungi found in the Atlantic Forest of south Bahia — *Beltraniella fertilis*: A. Conidiophore branched at the apex; B. Conidia and conidiophores. *Chaetosphaeria innumera*: C. Fasciculate conidiophores and clustered conidia. *Dictyosporium oblongum*: D, E. Oblong conidia. *Idriella acerosa*: F. Terminal conidiogenous cells; G. Semilunar conidia. Scale bars: A, B = 15 μ m; C = 5 μ m; D, E, G = 10 μ m; E = 30 μ m.

Dictyosporium oblongum (Fuckel) S. Hughes, Can. J. Bot. 36: 762 (1958). PLATE 2D,E

COLONIES effuse. CONIDIA oblong or irregular, $32.5\text{--}37.5 \times 10\text{--}12.5$ μ m, olivaceous, usually with 3–4 rows of cells of the same or different size, generally strongly constricted at the septa; cells 5 μ m wide at 10–11 per row.

SPECIMEN EXAMINED — **BRAZIL. BAHIA:** MUNICIPALITY OF URUÇUCA, Serra do Condurú (PESC), 14°23'08.4"S 39°04'37.9"W, on decomposing leaves of *Harleyodendron unifoliolatum*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1419).

DISTRIBUTION — Recorded in Europe and North America (Ellis 1971; GBIF 2014). First report for Brazil.

COMMENTS — The specimen analyzed agrees with the description presented by Ellis (1971).

Idriella acerosa R.F. Castañeda & W.B. Kendr., Univ. Waterloo Biology Series 35: 62 (1991). PLATE 2F,G

MYCELIUM superficial composed of brown, branched, septate smooth, hyphae 15–20 µm wide. CONIDIOPHORES mononematic, unbranched, erect, straight, 4–6-septate, brown with almost colorless apex, 55–123 × 4–5 µm. CONIDIOGENOUS CELLS terminal sympodial with diminutive denticles almost colorless at the apex, 15–22 × 2.5–5 µm. CONIDIA falciform with acute ends, non-septate, dry, smooth and colorless, 10–15 × 1.5 µm.

SPECIMEN EXAMINED — **BRAZIL. BAHIA:** MUNICIPALITY OF URUÇUCA, Serra do Condurú (PESC), 14°23'08.4"S 39°04'37.9"W, on decomposing leaves of *Harleyodendron unifoliolatum*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1421).

DISTRIBUTION — Described from Cuba, on dead leaves of *Samanea saman* and *Nectandra coriacea* (Castañeda-Ruiz & Kendrick 1991). Mexico (GBIF 2014). First report for Brazil.

COMMENTS — The specimen analyzed agrees with the description presented by Castañeda-Ruiz & Kendrick (1991).

Inesiosporium longispirale (R.F. Castañeda) R.F. Castañeda & W. Gams, Nova Hedwigia 64: 486 (1997). PLATE 3A

MYCELIUM superficial with septate, branched, smooth, brown to dark brown, hyphae 1–5 × 3–5 µm wide. CONIDIOPHORES undifferentiated, intercalated with CONIDIOGENOUS CELLS, short, subulate, dark brown, monoblastic, 12–20 × 5–5.5 µm. CONIDIA acrogenous, single, coiled, twisted, usually attenuated and truncated at the base, multi-septate, olivaceous to pale brown, with 3–10 spirals, smooth walled, 70–196 × 3–7 µm, spirals 50–65 µm × 18–36 µm, filaments 3–7 µm wide, olivaceous to pale brown, basal cells dark brown to brown.

SPECIMENS EXAMINED — **BRAZIL. BAHIA:** MUNICIPALITY OF UNA, Ecoparque, 15°10'01.7"S 39°03'14.2"W, on decomposing leaves of *Manilkara maxima*, 05/10/2008, D.M.A. Magalhães s.n. (CEPEC 1461); MUNICIPALITY OF ITACARÉ, Reserva Capitão, 14°21'16.7"S 39°03'23.3"W, on decomposing leaves of *Manilkara maxima*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1556); 05/10/2008, D.M.A. Magalhães s.n. (CEPEC 1405); MUNICIPALITY OF URUÇUCA, Serra do Conduru, 14°23'07.7"S 39°04'43.6"W, on decomposing leaves of *Harleyodendron unifoliolatum*, 05/10/2008, D.M.A. Magalhães s.n. (CEPEC 1462); 14°23'08.3"S 39°04'47.0"W, on decomposing leaves of *Manilkara maxima*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1553); 14°23'07.7"S 39°04'43.6"W,

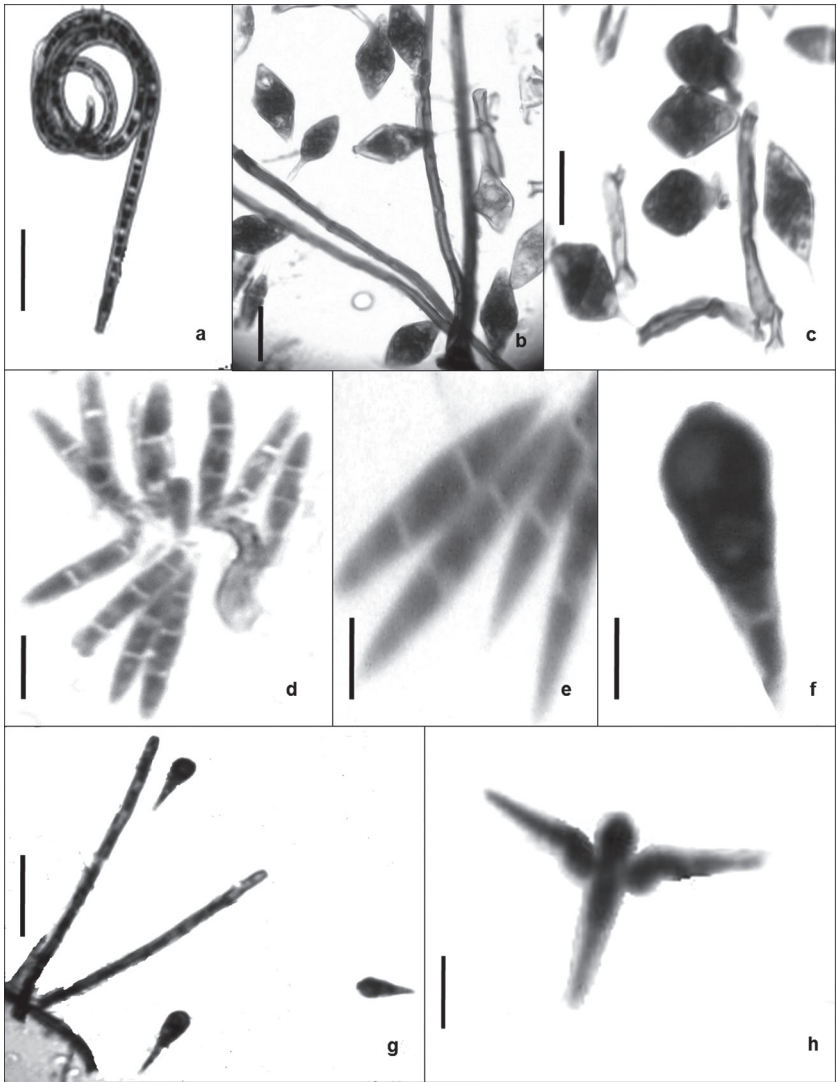


PLATE 3. Fungi found in the Atlantic Forest of south Bahia — *Inesiosporium longispirale*: A. Coiled conidia. *Pseudobeltrania macrospora*: B, C. Conidia and conidiophores. *Scolecobasidium tropicum*: D. Conidia and conidiophore; E. Septate conidia. *Sporidesmium coffeicola*: F. Straight or curved conidiophores and conidia; G. Obpyriform septate conidia. *Triscelophorus curviramifer*: H. Obclaviform conidia. Scale bars: A, F = 10 μ m; B, D, H = 15 μ m; C = 30 μ m; E, G = 5 μ m.

05/10/2008, D.M.A. Magalhães s.n. (CEPEC 1503); 12/21/2007, D.M.A. Magalhães s.n. (CEPEC 1425); 14°23'06.6"S 39°04'44.7"W, on decomposing leaves of *Parinari alvimii*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1555).

DISTRIBUTION — Found on dead leaves of *Calophyllum antillanum* and *Clusia rosea*, in Cuba (Castañeda-Ruiz & Gams 1997). First report for Brazil.

COMMENTS — The specimens analyzed are similar to the description presented by Castañeda-Ruiz & Gams (1997).

Pseudobeltrania macrospora Heredia, R.M. Arias, M. Reyes & R.F. Castañeda, Fungal Diversity 11: 103 (2002). PLATE 3B,C

COLONIES epiphyllous, effuse. MYCELIUM immersed. CONIDIOPHORES macronematous, single or fasciculate, simple, septate, erect, brown, darker at the apex, $45\text{--}88 \times 5\text{--}8 \mu\text{m}$, with basal cell radiated-lobed, up to $20 \mu\text{m}$ in diameter. CONIDIOGENOUS CELLS polyblastic, terminal, cylindrical, pale brown, $15\text{--}30 \times 6\text{--}7 \mu\text{m}$. CONIDIA holoblastic, single, rhomboid, with acute base and apiculate apex, olivaceous, smooth, $30\text{--}45 \times 15\text{--}20 \mu\text{m}$, with hyaline equatorial band.

SPECIMEN EXAMINED — BRAZIL. BAHIA: MUNICIPALITY OF ITACARÉ, Reserva Capitão, $14^{\circ}21'17.6''\text{S}$ $39^{\circ}03'23.4''\text{W}$, on decomposing leaves of *Parinari alvimii*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1412).

DISTRIBUTION — Mexico (Heredia et al. 2002). First report for Brazil.

COMMENTS — The specimen fits the description presented by Heredia et al. (2002).

Scoleobasidium tropicum Matsush., Matsushima Mycological Memoirs 3: 15 (1983). PLATE 3D,E

COLONIES effuse. HYPHAE SUPERFICIAL hyaline olivaceous, sparse. CONIDIOPHORES mononematous, macronematous, scattered, simple, cylindrical, 0–2-septate, brown, with denticulate ends elongating sympodially, $10\text{--}15 \times 5 \mu\text{m}$. CONIDIA fusiform, 2-septate, non-constricted at the septa, $17\text{--}20 \times 3\text{--}4 \mu\text{m}$, smooth, sub-hyaline.

SPECIMEN EXAMINED — BRAZIL. BAHIA: MUNICIPALITY OF UNA, at Ecoparque, $15^{\circ}10'01.8''\text{S}$ $39^{\circ}03'13.5''\text{W}$, on decomposing leaves of *Manilkara maxima*, 05/10/2008, D.M.A. Magalhães s.n. (CEPEC 1418).

DISTRIBUTION — Federated States of Micronesia, Canada, and Thailand, on dry petioles of *Cocos nucifera*. Republic of China (GBIF 2014). First report for Brazil.

COMMENTS — The specimen analyzed agrees with the description presented by Matsushima (1983).

Sporidesmium coffeicola M.B. Ellis, More Dematiaceous Hyphomycetes: 87 (1976). PLATE 3F,G

MYCELIUM immersed. CONIDIOPHORES straight or curved, septate, brown, smooth, $75\text{--}110 \times 3\text{--}5 \mu\text{m}$, percurrent. CONIDIA obpyriform, 2–3-septate, $15\text{--}25 \times 7\text{--}9 \mu\text{m}$, $2\text{--}2.5 \mu\text{m}$ at the base, with the two lower cells dark brown and upper cells sub-hyaline.

SPECIMEN EXAMINED — **BRAZIL. BAHIA:** MUNICIPALITY OF URUÇUCA, at Serra do Condurú, 14°23'07.0"S 39°04'43.9"W, on decomposing leaves of *Harleyodendron unifoliolatum*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1409).

DISTRIBUTION — Found in Iran (coffee leaves), Japan, and Mexico (GBIF 2014). First report for Brazil.

COMMENTS — The specimen analyzed agrees with the description presented by Ellis (1976).

Triscelophorus curviramifer Matsush., Matsushima Mycological Memoirs 7: 70 (1993).

PLATE 3H

CONIDIA obclavate, 1–3-septate, $19\text{--}37 \times 1.5\text{--}3.0\ \mu\text{m}$, with two obclavate branches, curved at the base, 0–1-septate, $9\text{--}22 \times 1.4\text{--}2.5\ \mu\text{m}$.

SPECIMENS EXAMINED — **BRAZIL. BAHIA:** MUNICIPALITY OF UNA, Ecoparque, 15°10'44.6"S 39°03'06.4"W, on decomposing leaves of *Parinari alvimii*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1503); MUNICIPALITY OF URUÇUCA, Serra do Condurú (PESC), 14°23'08.3"S 39°04'47.0"W, on decomposing leaves of *Manilkara maxima*, 7/12/2008, D.M.A. Magalhães s.n. (CEPEC 1502).

DISTRIBUTION — Peru on rotten leaves (Matsushima 1993), and Venezuela (Smits & Cressa 2005).

COMMENTS — The specimens analyzed agree with the description presented by Delgado-Rodríguez et al. (2004).

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